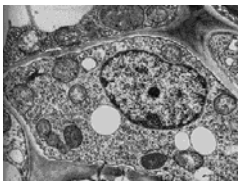
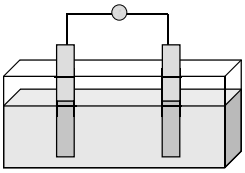
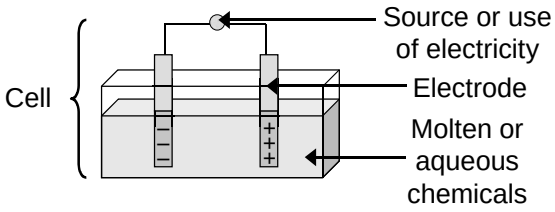


Types of cells



Overview

- "Cells" are containers of liquid with electrodes:



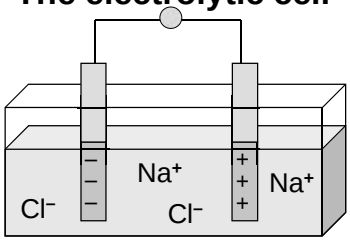
- In "electrolytic cells", electricity is used to force chemicals to undergo a redox reaction
- In "galavanic cells", electricity is produced spontaneously from a redox reaction

Assignment

- Read pg. 695 - 697. Answer these questions:

1) What in this room is a product of electrolysis?
2) Are ions at the anode gaining or losing electrons? What about at the cathode?
3) How is the conduction of electricity in a wire different from in an electrolytic cell.
4) Will electricity be conducted indefinitely through an electrolytic cell? Explain.
5) 697 gives the cell reaction for the electrolysis of NaCl. Write half reactions and the cell reaction for the electrolysis of HF(aq)

The electrolytic cell



- Electric current forces charges on electrodes
- Na^+ is attracted to negative, Cl^- to positive
- Na^+ takes up an electron: $Na^+(aq) + e^- \rightarrow Na$
- Cl^- gives up an electron: $2Cl^-(aq) \rightarrow Cl_2 + 2e^-$
- Thus electricity continues to flow
- Pure Na is deposited, Cl_2 gas is produced

Activity

1) Add a scoop of $CuCl_2$ to a 50 mL beaker
2) Add about 30 mL of distilled water
3) Stir until the $CuCl_2$ is completely dissolved
4) Remove a piece of aluminum (about 5 cm square) from the role of aluminum foil
5) Submerse the aluminum in the $CuCl_2(aq)$
6) What is produced? (think about the chemicals that you started with)
7) Write the redox reactions for what you saw:

___ + _e^- → ___ ___ → ___ + _e^-

8) Give the cell reaction
9) Dump solution down sink. Rinse & dry beaker

Assignment (read 17.5)

1) Where in the room is there a galvanic cell?
2) In fig.17.12, is a solution with Cu^{2+} needed for the Cu half-cell to conduct? Is a solution containing Ag^+ needed for the Ag half-cell?
3) Looking at 17.12, which electrode is losing electrons, which is gaining electrons, which is reduction, which is oxidation?
4) How do anodes and cathodes differ between electrolytic and galvanic cells?
5) Try PE 5 (similar to example 17.5)
6) You saw that Cu and Al react. How can these be used in a galvanic cell to produce energy (i.e. draw a diagram as in PE 5)